Title: Interactions between hypoxia and circadian clock among obstructive sleep apnea patients

Sleep disorders are becoming more serious health issue, especially in highly developed populations, including Poland. Obstructive sleep apnea syndrome (OSA) is a chronic condition characterized by recurrent pauses in breathing during sleep, which lead to intermittent hypoxia, arousals and sleep fragmentation. In recent years prevalence of OSA has drastically increased. It is estimated to affect even up to 50% of middle-aged man. Disruption of proper sleep architecture and intermittent hypoxia caused by OSA result in excessive daytime sleepiness, cognitive impairment, decrease in work effectiveness and greatly increased risk of car accidents. Additionally, OSA has been recognized as an independent risk factor for arterial hypertension, cardio-vascular diseases as well as impairment of glucose metabolism. Due to the extensive complications and comorbidities of the this order it is essential to better understand pathological mechanisms responsible for their occurrence.
In this project, we decided to focus on the interactions between hypoxia and plausible disruption of circadian clock, which based on available literature seem to form a bidirectional interaction. Such relationship between the two has been investigated only on animal and cellular models. However, there are no studies regarding this topic among OSA patients, who seem to be a perfect group to study these interactions considering the intermittent hypoxia present during sleep in these individuals. Therefore, we have chosen representative molecular factors of both, hypoxia and circadian clock, to investigate this very interesting relationship. As hypoxia and disruption of circadian clock have been shown to cause many complications on their own, understanding their relationship might not only enable better control of their unwanted effects, but also allow us to increase quality of life of OSA patients.